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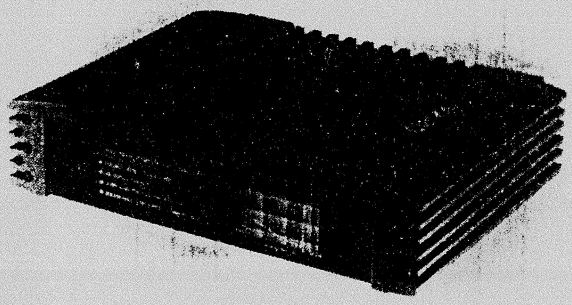
clarion Service Manual

Published by Service Administration Section



80W+80W (PEAK) DC SERVO STEREO POWER AMPLIFIER

Model 502HA (EE-714A)

■SPECIFICATIONS:

Circuit system : W-servo regulator
PWM±2 power units
Parallel push-pull complementary circuit
Current mirror load circuit
DC servo circuit
Rated power : 50W+50W (1 kHz, 0.1 %, 4Ω)
Max. power : 80W+80W (Peak)
Load impedance : 4Ω×2
Power supply voltage :
DC 14.4V (10.8 to 15.6V)
Negative ground
Current consumption :
15A (at rated power)
Dimensions : Width 245 mm
Height 62 mm
Depth 215 mm
Weight : 3.1 kg

■FEATURES:

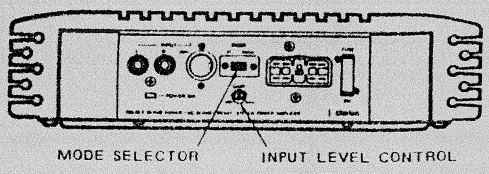
- Total Maximum Power Output 80W+80W (PEAK)
- EIAJ Max. Output Power 60W+60W (@ 1kHz, 10% THD)
- Continuous Output Power 100W (50W/ch. into 4 Ohm, 20Hz to 20kHz, @ 0.1% THD)
- Bridge (MONO) Capability (Max. 120W @ 10% THD)
- DC Servo Circuit
- Double Servo Regulator Power Supply Circuit
- Isolated Input Ground Circuit
- Adjustable Input Level Control
- 10Hz to 60kHz (−1dB) Frequency Response
- Overvoltage Protection System
- Overheating Protection Circuit
- Speaker Lead Short Protection Circuit
- Turn ON Muting Circuit (Soft Start)
- Automatic Remote Switching Circuit

■COMPONENTS:

● EE-714A-01

Main unit		1
Parts bag	653−0086−39	1
Lead holder	335−0833−01	5
Tap-screw	653−0086−48	6
Plate nut	653−0086−49	4
DIN cable	653−0088−04	1
Extension lead (Power supply)	852−7219−01	1
9 P connector	653−0088−03	1

■OPERATION:

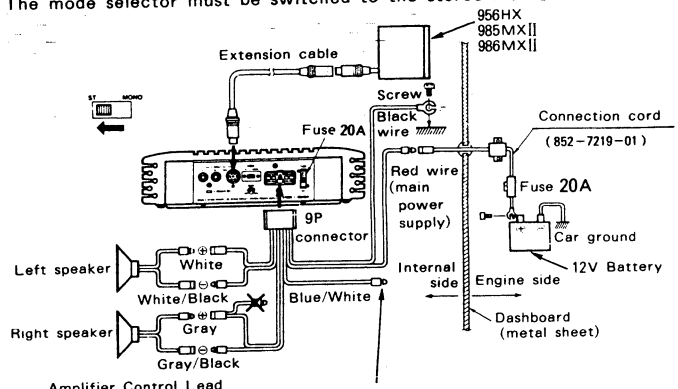


- MODE SELECTOR : Set the mode selector to the desired mode.
  MODE SELECTOR (MONO) : To use the amp for monaural reproduction only, remove the two screws, turn the plate 180° and fasten the plate using the two screws.
- INPUT LEVEL CONTROL : Adjust the input level control to obtain desired gain.

■WIRE CONNECTION:

■STEREO MODE

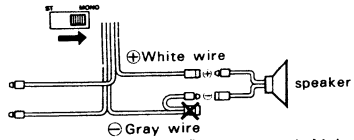
• The mode selector must be switched to the stereo mode.



Amplifier Control Lead
Connect to terminal of the Remote Switching Lead or Power Antenna Lead of the head unit. Amplifier control lead is connected in case RCA Line level Input used.

■MONO (BRIDGE) MODE

• The mode selector must be switched to the mono (bridge) mode.

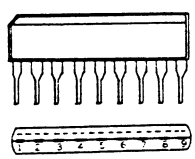


Note: 1) The head wires marked "X" are not used. Make sure that they are not in contact with metal.
2) When not using the DIN cord. Input to the RCA terminal. In this case, connect the amplifier control lead (blue/white) in the 9 pin connector to the external power lead from the unit. When using the RCA terminal in mono, only connect the left channel.
3) Use 4 ohms impedance speakers with maximum wattage rating of more than 80 watts (mono mode: 160 watts)

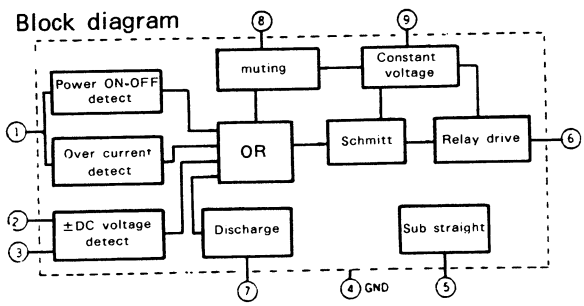
■EXPLANATION OF IC's:

■TA 7317P 051-0247-00 OCL
Power Amp. & Speaker protection circuit

Outward Form



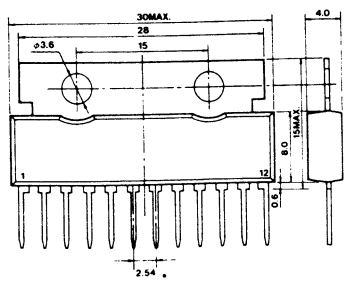
Block diagram



■ μPC1225H 653-0086-50 30～50W
Power amp • driver

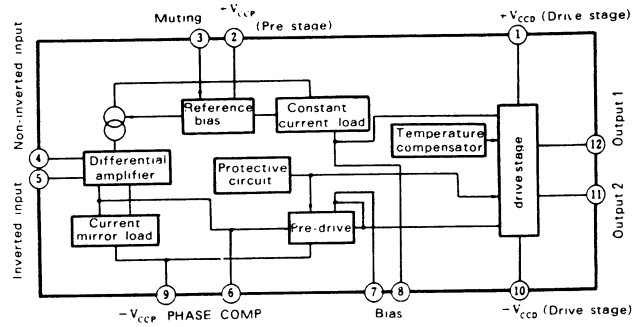
This IC is a stereo Hi-Fi power amplifier driver. It consists of a Voltage amplifier circuit, pre-drive circuit, drive circuit, and protective circuit.

Outward Form



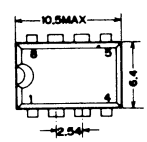
Terminal Description

端子No.	接　　続
1	$+V_{CCD}$ (Drive stage power)
2	$+V_{CCP}$ (Pre-drive stage power)
3	MUTING
4	INPUT
5	NFB
6	PHASE COMP
7	BIAS
8	BIAS
9	$-V_{CCP}$ (Pre-drive stage power)
10	$-V_{CCD}$ (Drive stage power)
11	LOWER OUTPUT
12	UPPER OUTPUT

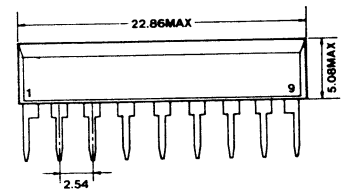


■ μPC4570C 659-0247-15 Super low noise,
μPC4570HA 653-0086-58 High speed, wide-band Dual OP. Amp.

Outward Form



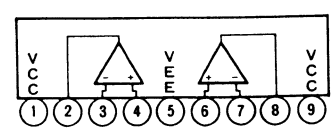
μPC4570C



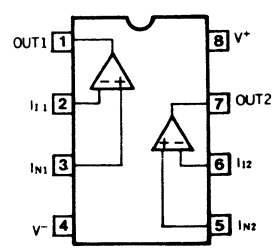
μPC4570HA

Feature
Phase compensation
Noise voltage refered to input (f=1kHz) $4.5nV/\sqrt{Hz}$
T.H.D (f=20Hz～20kHz) 0.002%
Slew rate 7V/μs

Block Diagram



μPC4570HA



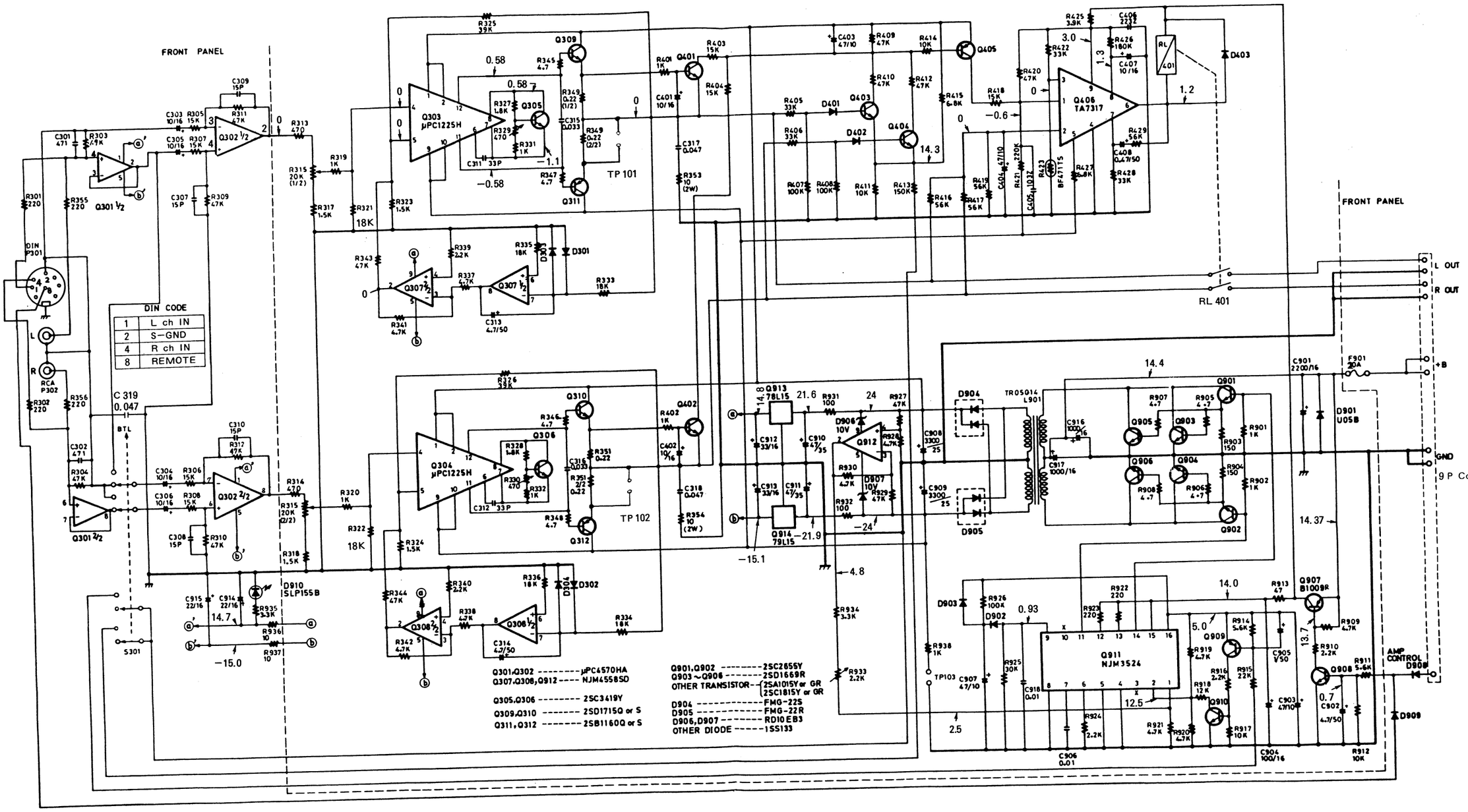
(Top View)

μPC4570C

■NJM 3524 051-0749-00 PWM
Switching Regulator Controller

Refer to the description in Explanation of ICS Vol. 2. (Page 50)

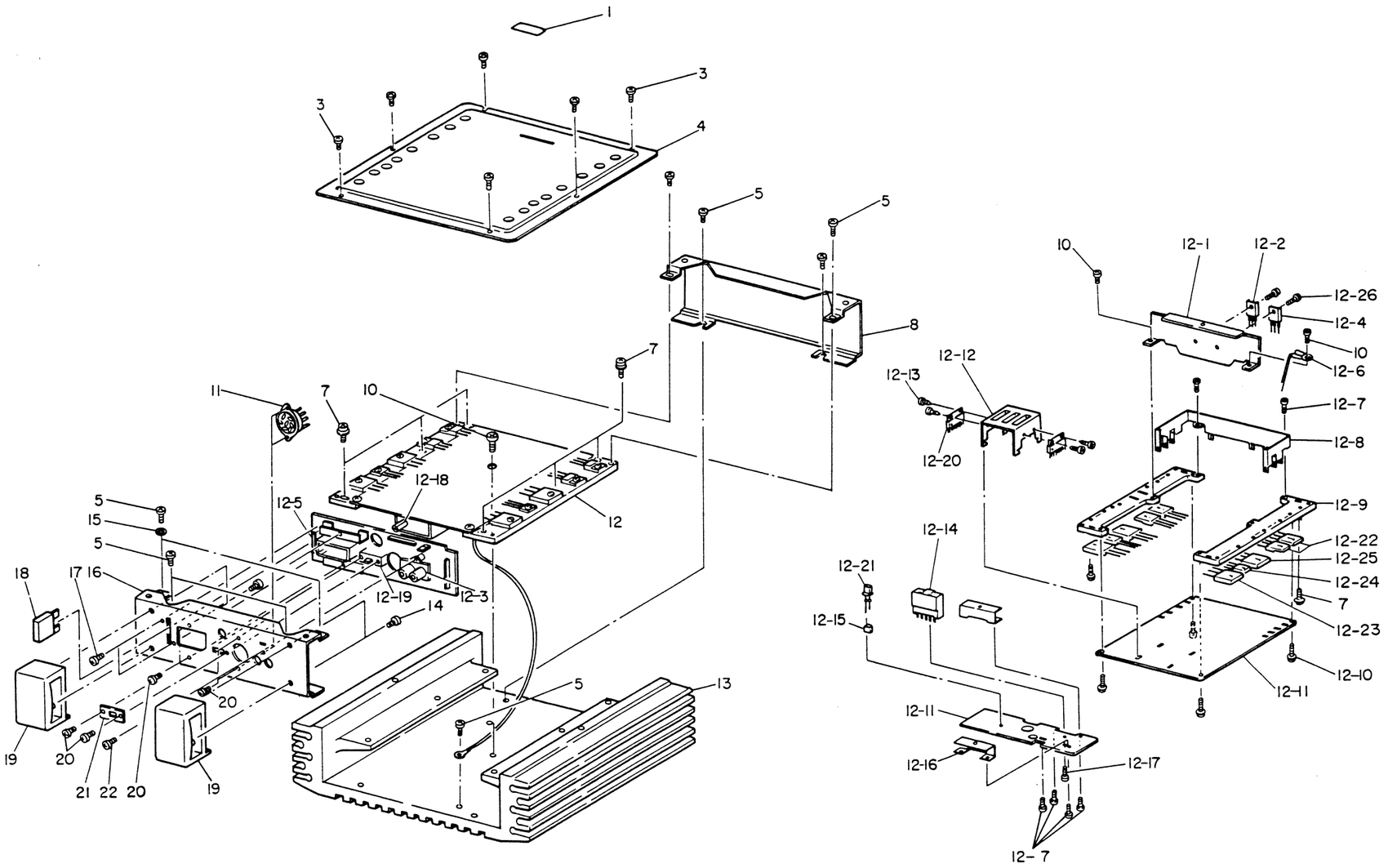
■CIRCUIT DIAGRAM:



※ The voltages are as measured with a digital voltmeter without stereo signals. (DCV)

Note : Remember that the heat sink for μPC 1225H is expressed in −Vcc.

■EXPLODED VIEW/PARTS LIST:



REF. NO.	PART NO.	DESCRIPTION	Q'TY
1	286-6999-00	Setplate	1
3	653-0086-03	B-tight φ3×6 (BLK)	6
4	653-0087-07	Lower case	1
5	653-0086-05	B-tight φ3×6	9
7	653-0086-07	Double sems M3×12	16
8	653-0087-06	Face panel	1
10	653-0086-10	B-tight φ3×8	3
11	653-0088-01	DIN SOCKET	1
12	—	AMP ASSY	1
12-1	653-0086-22	Heat sink	1
12-2	653-0086-12	Diode (FMG22S)	1
12-3	653-0086-24	Pin jack	1

REF. NO.	PART NO.	DESCRIPTION	Q'TY
12-4	653-0087-13	Diode (FMG22R)	1
12-5	653-0086-26	AUTO FUSE holder	1
12-6	653-0086-27	Posistor	1
12-7	653-0086-28	B-tight φ3×6	6
12-8	653-0087-16	Earth bar	1
12-9	653-0087-15	Heat sink	2
12-10	653-0086-31	B-tight φ3×8	4
12-11	653-0087-19	PCB	1
12-12	653-0086-33	Heat sink	1
12-13	653-0086-34	Screw M3×6	4
12-14	653-0086-35	Connector	1
12-15	653-0086-36	LED holder	1

REF. NO.	PART NO.	DESCRIPTION	Q'TY
12-16	653-0086-37	Connector bracket	2
12-17	653-0086-38	P-tight φ3×8	1
12-18	653-0086-62	Variable resistor	1
12-19	653-0086-67	Slide switch	1
12-20	653-0086-50	IC (μPC1225H)	2
12-21	653-0086-59	LED	1
12-22	653-0087-11	Transistor (2SD1669)	4
12-23	653-0086-52	Transistor (2SD1715)	2
12-24	102-3419-25	Transistor (2SC3419Y)	2
12-25	653-0086-53	Transistor (2SB1160)	2
12-26	653-0087-17	Sems screw M3×8	2
13	653-0087-04	Heat sink	1

REF. NO.	PART NO.	DESCRIPTION	Q'TY
14	653-0086-14	Screw M4×6 (BLK)	4
15	653-0086-15	WASHER φ3	2
16	653-0089-01	Escutcheon	1
17	653-0086-17	P-tight φ2×6	2
18	060-0057-08	Auto fuse (20A)	1
19	653-0086-18	Handle	2
20	653-0086-19	Screw M2.6×5 (BLK)	6
21	653-0086-20	Lock plate	1
22	653-0086-21	P-tight φ3×8 (BLK)	1

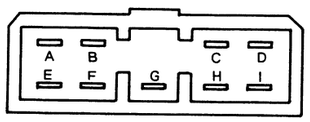
■PARTS LIST: ◎ Electrical Section

REF. NO.	PART NO.	DESCRIPTION	Q'TY
Q 301, 302	653-0086-58	IC (μPC 4570HA)	2
Q 303, 304	653-0086-50	IC (μPC 1225H)	2
Q 305, 306	102-3419-25	Transistor (2SC 3419Y)	2
Q 307, 308, 912	653-0086-51	IC (NJM 4558SD)	3
Q 309, 310	653-0086-52	Transistor (2SD 1715Q, S)	2
Q 311, 312	653-0086-53	Transistor (2SB 1160Q)	2
Q 401, 402, 403, 404, 908, 910	102-1815-51	Transistor (2SC 1815GR)	6
Q 405, 911	100-1015-25	Transistor (2SA 1015Y)	2
Q 406	051-0247-00	IC (TA 7317P)	1
Q 901, 902	102-2655-25	Transistor (2SC 2655Y)	2
Q 903, 904, 905, 906	653-0087-11	Transistor (2SD 1669R)	4
Q 907	653-0086-55	Transistor (2SB 1009R)	1
Q 911	051-0749-00	IC (NJM 3524D)	1
Q 913	653-0086-68	IC (78L 15)	1
Q 914	653-0085-69	IC (79L 15)	1
D 301～304 401～403 902, 903, 908 909	001-0294-00	Diode (1SS 133)	11
D 901	001-0100-00	Diode (U05B)	1
D 904	653-0087-12	Diode (FMG-22S)	1
D 905	653-0087-13	Diode (FMG-22R)	1
D 906, 907	001-0323-45	Diode (RD 10EB 3)	1
D 910	653-0086-59	LED (SLP-155B)	1
L 301, 302	653-0086-60	Coil	2
L 901	653-0087-14	DC-DC coil	1
C 311, 312	174-3300-46	Ceramic capacitor (33pF SL)	2
C 313, 314, 902	179-4753-62	Electrolytic capacitor (50V 4.7 μF)	3
C 315, 316	173-3331-10	Polyester capacitor (50V 0.033 μF)	2
C 317, 318, 319	173-4731-10	Polyester capacitor (50V 0.047 μF)	3
C 906, 918	173-1031-10	Polyester capacitor (50V 0.01 μF)	2
C 401, 402, 407	179-1063-32	Electrolytic capacitor (16V 10 μF)	3
C 403, 404, 903, 907	179-4763-22	Electrolytic capacitor (10V 47 μF)	4
C 408	179-4743-62	Electrolytic capacitor (50V 0.47 μF)	1
C 904	179-1073-32	Electrolytic capacitor (16V 100 μF)	1
C 905	179-1053-62	Electrolytic capacitor (50V 1 μF)	1
C 910, 911	179-4763-52	Electrolytic capacitor (35V 47 μF)	2
C 912, 913	179-3363-32	Electrolytic capacitor (16V 33 μF)	2
C 916, 917	179-1083-33	Electrolytic capacitor (16V 1000 μF)	2
C 307～310	174-1500-46	Ceramic capacitor (15pF SL)	4
C 405	160-1035-06	Ceramic capacitor (0.01 μF)	1
C 406	160-2235-06	Ceramic capacitor (0.022 μF)	1
C 301, 302	160-4712-05	Ceramic capacitor (470pF)	2
C 901	179-2283-32	Electrolytic capacitor (16V 2200 μF)	1
C 303～306	182-1063-32	Electrolytic capacitor (16V 10 μF)	4
C 914, 915	182-2263-32	Electrolytic capacitor (16V 22 μF)	2
C 908, 909	653-0087-18	Electrolytic capacitor (25V 3300 μF)	2
R 423	653-0086-27	Posistor	1
RL 401	653-0086-66	Relay	1
R 315	653-0086-62	Variable resistor	1
R 329, 330	653-0086-63	Variable resistor	2
R 933	653-0086-65	Variable resistor	1
R 349, 351	653-0086-64	Cement resistor (5W 0.22)	2
R 353, 354	114-1001-21	Metalize resistor (2W 10Ω)	2

Printed in Japan 298-3784-00 JAN. 1988 CHU

■PRINTED WIRING BOARD:

A	LEFT SPEAKER ⊕
B	RIGHT SPEAKER ⊕
C	GND
D	ACC
E	LEFT SPEAKER ⊖
F	RIGHT SPEAKER ⊖
G	AMP CONTROL +B
H	GND
I	ACC



1	L ch INPUT
2	SIGNAL GND
3	
4	R ch INPUT
5	
6	
7	
8	REMOTE POWER ON-OFF VOLTAGES

INPUT
R(RED)
L(WHT)

■ADJUSTMENTS:

1. POWER SUPPLY VOLTAGE:
   Adjust R 933 so that the voltage of TP 103 is −24V±0.2V.
2. IDLING CURRENT
   Before making adjustments, preheat under the following conditions:
   Time : 15 minutes
   Voltage : 14.4V
   Input signal : No signal (Input shorted)
   Output load : None

   Adjust R 329 (L) so that the voltage of TP 101 is 4.4mV±0.2mV.
   Adjust R 330 (R) so that the voltage of TP 102 is 4.4mV±0.2mV.

502HA